PATENT

NOVEL POLYMERASE COMPOSITIONS AND USES THEREOF

ABSTRACT

The subject invention provides novel compositions containing a mixture of (a) an enzyme that possesses substantial 3'-5' exonuclease activity (b) a DNA polymerase with less 3'-5' exonuclease activity than the enzyme with substantial 3'-5' exonuclease activity. Preferably, the DNA polymerase for inclusion in the compositions are DNA polymerases that substantially lack 3'-5' exonuclease activity. A preferred embodiment of the invention is a composition comprising the *Taq* DNA polymerase (isolated from Thermus aquaticus) and the *Pfu* DNA polymerase (isolated from Pyrococcus furiosus). Another aspect of the invention is to provide methods for synthesizing polynucleotides, typically DNA, using compositions comprising an enzyme that possesses substantial 3'-5' exonuclease activity and a DNA polymerase with less 3'-5' exonuclease activity than the enzymes possessing substantial 3'-5' exonuclease activity, preferably a DNA polymerase that substantially lacks 3'-5' exonuclease activity. Another aspect of the invention involves the use the subject method of polynucleotide synthesis to carry out the synthesis step in a polymerase chain reaction experiment. Yet another aspect of the invention is to provide kits for the synthesis of polynucleotides, wherein the kits comprise an enzyme that possesses substantial 3'-5' exonuclease activity and a DNA polymerase with less 3'-5' exonuclease activity than the enzyme possessing substantial 3'-5' exonuclease activity.